

SUPPORTING INFORMATION

Weston, D.P., You, J., Lydy, M.J. - Distribution and toxicity of sediment-associated pesticides in agriculture-dominated water bodies of California's Central Valley.

10 pages (3 tables)

Table S1. Site designations and locations of the 42 stations sampled. Each station in the PUR-guided study is identified by a unique two-letter code, while irrigation return samples all have an “AD” prefix, followed by the station number.

STATION	COUNTY	TIMES OF SAMPLING	LOCATION
MS	Butte	July '02, Mar. '03	Morisson Slough @ Luckehe Rd.
AD18	Colusa	Apr. '03, Aug. '03	Stone Corral Creek @ 4-Mile Rd.
AD19	Colusa	Apr. '03, Aug. '03	East Drain @ 4-Mile Rd.
AD21	Colusa	Apr. '03, Aug. '03	Sand Creek @ Miller Rd.
BD	Fresno	Nov. '02	Fresno Slough @ Mt. Whitney Rd.
CD	Fresno	Mar. '03	Crescent Ditch @ Lassen Rd.
FS	Fresno	Aug. '02, Mar. '03	Unnamed canal @ Malaga & James Rd.
FA	Fresno	Aug. '02	Unnamed canal @ American & Tuolumne Rd.
FL	Fresno	Nov. '02, Mar. '03	Tailwater pond, Lassen Rd., 8.6 km north of Rt. 198
LL	Fresno	Nov. '02, Mar. '03	Tailwater pond, Lassen Rd., 3.7 km north of Rt. 198
TL	Fresno	Mar. '03	Unnamed canal @ Jefferson & Tuolumne Rd.
MA	Fresno	Mar. '03	Unnamed canal @ Marin & Adams Rd.
DC	Madera	July '02, Mar. '03	Dry Creek @ Avenue 21
MP	Madera	July '02, Mar. '03	Unnamed canal, Road 26, 70 m south of Dry Creek
RC	Madera	July '02, Mar. '03	Root Creek @ Rd. 38
AD2	San Joaquin	Apr. '03, Aug. '03	Unnamed canal @ Woodsbro Rd. & Highway 4
AD3	San Joaquin	Apr. '03, Aug. '03	Unnamed canal @ McDonald & Boulton Rd.
AD5	San Joaquin	Apr. '03, Aug. '03	Unnamed canal @ 11751 Wing Levee Rd.
AD6	San Joaquin	Apr. '03, Aug. '03	Unnamed canal @ Bowman Rd.
AD7	San Joaquin	Apr. '03, Aug. '03	Lone Tree Creek @ Newcastle Rd.
AD8	San Joaquin	Apr. '03, Aug. '03	Little John Creek @ Newcastle Rd.
AD9	San Joaquin	Apr. '03, Aug. '03	Walthal Slough @ Woodward Ave.
JQ	San Joaquin	Mar. '03	San Joaquin River @ Airport Way
AD13	Solano	Apr. '03, Aug. '03	Ulati Creek @ Highway 113
AD10	Stanislaus	Mar. '03, Aug. '03	Turlock Irrigation District Lateral #3 @ Jennings Rd.
AD11	Stanislaus	Mar. '03, Aug. '03	Unnamed canal @ Pomelo Ave. near Paradise Ave.
AR	Stanislaus	Aug '02	Dry Creek @ Albers Rd.
DP	Stanislaus	Aug. '02, Mar. '03	Del Puerto Creek @ Vineyard Ave.
HL	Stanislaus	Aug. '02, Mar. '03	High Line Canal @ Keyes Rd.
IC	Stanislaus	Mar. '03	Ingram Creek @ Route 33

Table S1 continued.

STATION	COUNTY	TIMES OF SAMPLING	LOCATION
JN	Stanislaus	Mar. '03	San Joaquin River @ Grayson Rd.
OC	Stanislaus	Mar. '03	Orestimba Creek @ River Rd.
SJ	Stanislaus	July '02, Mar. '03	San Joaquin River @ Route 132
GS	Sutter	July '02, Mar. '03	Gilsizer Slough @ George Washington Rd.
SS	Sutter	July '02	Snake Slough @ Clark Rd.
WC	Sutter	Mar. '03	Wadsworth Canal @ East Butte Rd.
AD15	Yolo	Apr. '03, Aug. '03	Lateral to Gordon Slough @ Rd. 19
AD16	Yolo	Apr. '03, Aug. '03	Gordon Slough @ Rd. 19
AD17	Yolo	Apr. '03	Willow Slough @ Rd. 27
AD24	Yolo	Apr. '03, Aug. '03	Knight's Landing Ridge Cut @ Rd 16 N
FR	Yuba	July '02, Mar. '03	Feather River @ Algodon Rd.
JS	Yuba	Mar. '03	Jack Slough @ Jack Slough Rd.

Table S2. Physical properties and pesticide residues in the sediments sampled. Pesticide concentrations as ng/g, dry weight basis, with <1 ng/g indicated by “U”. Bif=bifenthrin, Esf=esfenvalerate, Lam=lambda-cyhalothrin, Per=permethrin, Diel=dieldrin, Endr=endrin, Endo=endosulfan, and Met=methoxychlor.

Station	Sampling time	% silt and clay	% organic carbon	Bif	Esf	Lam	Per	Total BHC	Total DDT	Diel	Total Endr	Total Endo	Met
AD2	Apr. '03	33.1	0.53	U	U	1.0	7.2	U	9.2	U	U	U	U
AD2, rep. 1	Aug. '03	67.2	2.35	U	9.7	U	15.1	2.2	20.1	U	U	U	U
AD2, rep. 2	Aug. '03	75.7	2.38	U	12.2	U	18.7	3.1	23.6	U	U	U	1.1
AD3	Apr. '03	28.5	2.25	U	U	U	2.0	U	2.5	U	2.4	U	U
AD3	Aug. '03	30.8	5.99	U	1.7	U	U	1.4	9.8	1.8	U	U	1.0
AD5	Apr. '03	40.9	1.06	U	U	U	3.9	U	25.1	U	6.7	U	U
AD5	Aug. '03	68.0	1.65	U	10.9	U	129	1.3	14.3	1.1	U	U	U
AD6	Apr. '03	87.6	1.80	U	5.1	U	20.7	U	15.4	1.2	962	U	2.0
AD6	Aug. '03	91.2	1.49	U	27.5	U	U	1.3	13.5	1.2	U	U	U
AD7	Apr. '03	63.5	2.78	1.3	U	U	1.2	U	8.5	2.0	U	U	U
AD8	Apr. '03	34.8	0.62	U	U	U	8.1	U	6.5	U	1.9	1	U
AD8	Aug. '03	32.3	1.06	U	30.0	U	U	U	34.9	1.8	1.2	1.3	U
AD9	Apr. '03	63.0	2.33	U	U	U	6.5	U	14.9	U	1.7	U	1.5
AD9	Aug. '03	30.1	1.22	U	U	U	1.1	U	5.5	U	U	1.0	3.8
AD10	Mar. '03	14.0	0.47	U	U	U	1.3	U	1.4	U	345	U	U
AD10	Aug. '03	20.0	0.77	U	1.7	U	1.9	U	3.7	U	U	U	2.5
AD11	Mar. '03	78.7	1.25	U	U	U	1.4	U	17.5	U	9.2	U	1.4
AD11	Aug. '03	52.6	1.13	U	2.2	U	U	U	6.9	U	U	U	U
AD13	Apr. '03	57.7	1.09	U	U	U	5.7	U	11.2	U	1.3	U	1.3
AD13	Aug. '03	56.0	1.81	U	U	U	U	8.5	2.1	U	U	U	1.1
AD15	Apr. '03	53.4	0.39	U	U	U	U	U	3.8	2.0	3.9	U	U
AD15	Aug. '03	71.8	0.96	U	U	U	U	U	4.5	U	U	1.2	4.5
AD16	Apr. '03	58.9	1.22	U	U	U	1.4	U	9.5	U	1.1	U	U
AD16	Aug. '03	81.5	2.20	U	U	U	1.1	3.4	5.9	U	U	U	U

Table S2 continued.

Station	Sampling time	% silt and clay	% organic carbon	Bif	Esf	Lam	Per	Total BHC	Total DDT	Diel	Total Endr	Total Endo	Met
AD17	Apr. '03	96.5	0.86	U	U	U	U	U	20.7	U	U	U	U
AD18	Apr. '03	69.1	0.85	U	U	U	U	U	13.8	374	U	U	190
AD18, rep. 1	Aug. '03	47.6	1.72	U	U	U	U	U	1.3	U	U	U	5.9
AD18, rep. 2	Aug. '03	51.7	1.03	U	U	U	U	U	1.7	U	U	U	1.2
AD19	Apr. '03	56.8	1.67	U	U	U	13.8	U	8.8	U	399	U	U
AD19	Aug. '03	66.3	0.86	U	U	U	U	U	16.2	U	U	1.1	9.0
AD21	Apr. '03	52.8	0.44	U	U	U	U	U	3.8	U	1.9	U	U
AD21	Aug. '03	40.2	0.70	U	U	U	U	U	U	U	U	U	5.0
AD24	Apr. '03	69.6	0.97	U	U	U	U	U	23.6	U	1.0	U	117
AD24	Aug. '03	54.4	1.30	U	U	U	U	U	20.1	1.3	U	2.3	8.1
AR	Aug. '02	6.7	0.26	U	U	U	1.5	U	U	U	U	U	U
BD	Nov. '02	24.6	0.81	U	U	U	1.4	U	2.3	1.0	2.0	3.6	2.8
CD	Mar. '03	70.4	0.35	1.8	U	U	9.4	U	5.4	U	U	1.3	U
DC	July '02	17.2	3.16	1.1	1.4	U	7.3	2.3	3.1	U	2.5	U	1.6
DC	Mar. '03	15.6	0.90	U	U	U	U	U	U	U	U	U	U
DP	Aug. '02	83.7	1.09	21.0	17.9	2.6	46.9	15.8	78.5	2.6	10.1	17.7	22.7
DP, rep. 1	Mar. '03	58.9	1.40	2.8	1.9	1.0	7.4	U	48.4	1.4	U	U	U
DP, rep. 2	Mar. '03	35.0	0.50	U	1.4	U	3.7	U	33.2	1.3	1.4	U	1.1
FA	Aug. '02	48.4	1.01	U	U	U	1.5	4.3	5.8	U	U	U	U
FL, rep.1	Nov. '02	54.7	0.48	U	U	U	224	1.1	85.6	1.9	9.8	22.3	1.7
FL, rep. 2	Nov. '02	56.5	0.65	2.6	1.3	U	133	1.3	97.4	1.7	10.3	23.2	4.3
FL	Mar. '03	72.6	0.88	U	U	U	14.1	U	76.1	1.2	1.2	12.6	U
FR, rep. 1	July '02	48.6	1.11	U	1.0	U	4.5	2.5	2.3	1.4	U	U	U
FR, rep 2	July '02	16.0	0.61	U	U	U	4.0	U	U	U	U	U	4.6
FR	Mar. '03	7.5	0.18	U	U	U	U	U	U	U	U	U	U
FS, rep. 1	Aug. '02	58.1	0.59	3.6	U	2.6	10.1	1.1	408	11.3	9.3	11.6	2.2

Table S2 continued.

Station	Sampling time	% silt and clay	% organic carbon	Bif	Esf	Lam	Per	Total BHC	Total DDT	Diel	Total Endr	Total Endo	Met
FS, rep. 2	Aug. '02	55.8	0.55	2.0	U	2.3	5.8	U	60.0	5.7	6.3	10.7	1.6
FS	Mar. '03	64.3	1.09	U	U	U	2.3	U	11.8	2.3	U	1.7	U
GS	July '02	44.4	1.15	U	1.4	U	2.5	1.2	5.5	U	U	U	U
GS	Mar. '03	36.9	1.72	U	U	U	5.3	U	8.0	U	U	U	U
HL	Aug. '02	36.3	0.91	U	U	U	1.0	U	2.7	U	U	U	U
HL	Mar. '03	17.5	0.23	U	U	U	U	U	U	U	U	U	U
IC, rep.1	Mar. '03	77.9	0.80	1.4	2.2	1.6	6.8	U	228	2.7	3.5	1.7	U
IC, rep. 2	Mar. '03	49.8	1.25	U	7.3	1.5	14.1	U	155	5.3	9.2	2.3	U
JN	Mar. '03	80.9	1.97	U	U	U	3.8	U	14.0	U	U	U	1.1
JQ	Mar. '03	28.0	0.77	U	U	U	1.0	U	4.7	U	U	U	U
JS	Mar. '03	55.8	2.05	U	U	U	3.2	U	4.8	4.7	U	2.7	U
LL, rep 1	Nov. '02	70.2	1.00	6.5	7.0	16.8	459	11.4	371	2.9	27.7	81.5	16.4
LL, rep. 2	Nov. '02	75.1	0.76	28.8	11.6	8.3	290	7.1	257	2.3	18.1	62.5	14.7
LL	Mar. '03	56.0	0.32	7.2	U	1.0	70.5	U	384	3.3	24.4	571	1.6
MA	Mar. '03	60.8	1.30	8.8	U	7.8	6.0	U	61.2	1.9	U	11.3	U
MP	July '02	29.2	0.80	U	U	U	8.2	U	1.6	U	U	U	U
MP	Mar. '03	no data	no data	U	U	U	U	U	3.7	U	U	U	U
MS	July '02	34.3	1.26	U	1.3	U	5.9	6.9	61.4	U	U	U	U
MS	Mar. '03	41.6	1.84	U	10.7	U	7.8	U	67.4	U	U	U	U
OC	Mar. '03	16.8	0.27	1.1	U	U	5.7	U	30.5	U	U	U	1.0
RC	July '02	45.4	1.05	U	1.1	U	55.4	U	U	U	U	U	2.8
RC	Mar. '03	64.8	1.40	7.7	U	U	120	U	4.8	U	U	U	U
SJ, rep. 1	July '02	57.4	0.78	1.2	2.7	1.0	U	U	54.5	U	2.2	2.2	6.3
SJ, rep. 2	July '02	55.3	0.64	U	1.8	U	U	U	35.2	U	1.0	1.2	U
SJ	Mar. '03	26.5	0.81	U	U	U	2.6	U	5.5	U	U	U	U
SS, rep. 1	July '02	20.7	0.30	U	U	U	U	1.7	8.0	U	U	U	U

Table S2 continued.

Station	Sampling time	% silt and clay	% organic carbon	Bif	Esf	Lam	Per	Total BHC	Total DDT	Diel	Total Endr	Total Endo	Met
SS, rep. 2	July '02	21.2	0.48	U	U	U	U	1.4	3.1	U	U	U	1.2
TL, rep. 1	Mar. '03	57.6	1.36	10.4	U	U	U	U	7.5	U	U	1.0	U
WC	Mar. '03	14.7	0.52	U	1.1	U	1.9	U	4.0	U	U	U	U

Total BHC = Sum of alpha-, beta-, delta- and gamma-BHC

Total DDT = Sum of p,p'-DDT, p,p'-DDE, and p,p'-DDD

Total endrin = Sum of endrin, endrin aldehyde and endrin ketone

Total endosulfan = Sum of alpha- and beta-endosulfan and endosulfan sulfate

Table S3. Results of 10-d sediment toxicity tests with *Hyaella azteca* and *Chironomus tentans*. “nd” indicates sample not tested.

SAMPLE (replicate)	TIME OF SAMPLING	<i>H. azteca</i> (mean % survival \pm s.d.)	<i>C. tentans</i> (mean % survival \pm s.d.)
TOXIC TO BOTH SPECIES			
FL (rep. 1)	Nov. '02	3 \pm 5	2 \pm 4
FL (rep. 2)	Nov. '02	17 \pm 6	40 \pm 17
LL (rep. 1)	Nov. '02	2 \pm 4	0 \pm 0
LL	Mar. '03	24 \pm 29	0 \pm 0
TOXIC TO <i>C. TENTANS</i> (minimal <i>H. azteca</i> mortality or species not tested)			
DC	July '02	74 \pm 36	50 \pm 28
FR (rep. 2)	July '02	94 \pm 9	42 \pm 36
FS (rep. 1)	Aug. '02	82 \pm 11	56 \pm 24
FS (rep. 2)	Aug. '02	nd	46 \pm 11
GS	Mar. '03	84 \pm 17	38 \pm 8
LL (rep. 2)	Nov. '02	nd	0 \pm 0
TOXIC TO <i>H. AZTECA</i> (minimal <i>C. tentans</i> mortality or species not tested)			
AD2	Apr. '03	3 \pm 7	nd
AD2 (rep. 1)	Aug. '03	19 \pm 18	nd
AD2 (rep. 2)	Aug. '03	16 \pm 9	nd
AD5	Aug. '03	53 \pm 27	nd
AD6	Apr. '03	61 \pm 25	nd
AD6	Aug. '03	15 \pm 19	nd
AD8	Aug. '03	33 \pm 18	nd
AD11	Mar. '03	66 \pm 27	nd
AD18	Apr. '03	64 \pm 28	nd
AD21	Apr. '03	69 \pm 17	nd
DP	Aug. '02	22 \pm 16	72 \pm 42
DP (rep. 1)	Mar. '03	10 \pm 14	88 \pm 8
DP (rep. 2)	Mar. '03	42 \pm 16	nd
IC (rep. 1)	Mar. '03	15 \pm 13	74 \pm 9
IC (rep. 2)	Mar. '03	10 \pm 14	nd
MA	Mar. '03	0 \pm 0	72 \pm 22
MS	Mar. '03	32 \pm 33	56 \pm 15
SJ (rep. 2)	July '02	66 \pm 15	nd
TL (rep. 1)	Mar. '03	18 \pm 18	82 \pm 20
TL (rep. 2)	Mar. '03	46 \pm 13	74 \pm 9

Table S3 continued.

NON-TOXIC SAMPLES (mortality not significantly different from control)			
SAMPLE (replicate)	TIME OF SAMPLING	<i>H. azteca</i> (mean % survival \pm s.d.)	<i>C. tentans</i> (mean % survival \pm s.d.)
AD3	Apr. '03	88 \pm 10	nd
AD3	Aug. '03	90 \pm 12	nd
AD5	Apr. '03	83 \pm 17	nd
AD7	Apr. '03	76 \pm 23	nd
AD8	Apr. '03	80 \pm 19	nd
AD9	Apr. '03	83 \pm 12	nd
AD9	Aug. '03	91 \pm 10	nd
AD10	Mar. '03	78 \pm 9	nd
AD10	Aug. '03	89 \pm 8	nd
AD11	Aug. '03	77 \pm 8	nd
AD13	Apr. '03	78 \pm 20	nd
AD13	Aug. '03	83 \pm 24	nd
AD15	Apr. '03	90 \pm 11	nd
AD15	Aug. '03	86 \pm 10	nd
AD16	Apr. '03	83 \pm 18	nd
AD16	Aug. '03	84 \pm 9	nd
AD17	Apr. '03	86 \pm 13	nd
AD18 (rep. 1)	Aug. '03	95 \pm 8	nd
AD18 (rep. 2)	Aug. '03	85 \pm 12	nd
AD19	Apr. '03	83 \pm 19	nd
AD19	Aug. '03	98 \pm 5	nd
AD21	Aug. '03	96 \pm 5	nd
AD24	Apr. '03	85 \pm 14	nd
AD24	Aug. '03	87 \pm 5	nd
AR	Aug. '02	98 \pm 5	86 \pm 11
BD	Nov. '02	98 \pm 4	90 \pm 12
CD	Mar. '03	74 \pm 15	80 \pm 14
DC	Mar. '03	90 \pm 10	60 \pm 10
FA	Aug. '02	80 \pm 0	70 \pm 21
FL (rep. 1)	Mar. '03	78 \pm 35	78 \pm 18
FR (rep. 1)	July '02	nd	96 \pm 5
FR	Mar. '03	90 \pm 10	84 \pm 5
FS	Mar. '03	84 \pm 11	88 \pm 13
GS (rep. 1)	July '02	90 \pm 8	76 \pm 26
GS (rep. 2)	July '02	nd	93 \pm 10
HL	Aug. '02	95 \pm 10	74 \pm 21
HL	Mar. '03	95 \pm 10	93 \pm 5

Table S3 continued.

NON-TOXIC SAMPLES (continued)			
SAMPLE (replicate)	TIME OF SAMPLING	<i>H. azteca</i> (mean % survival \pm s.d.)	<i>C. tentans</i> (mean % survival \pm s.d.)
JN	Mar. '03	74 \pm 24	82 \pm 20
JQ	Mar. '03	88 \pm 22	74 \pm 15
JS	Mar. '03	90 \pm 10	70 \pm 20
MP	July '02	94 \pm 5	78 \pm 8
MS (rep. 1)	July '02	92 \pm 13	86 \pm 11
MS (rep. 2)	July '02	nd	86 \pm 11
OC	Mar. '03	60 \pm 32	72 \pm 16
RC	July '02	93 \pm 10	70 \pm 16
RC	Mar. '03	76 \pm 28	78 \pm 18
SJ (rep. 1)	July '02	48 \pm 26	66 \pm 15
SJ	Mar. '03	80 \pm 16	70 \pm 25
SS (rep. 1)	July '02	nd	76 \pm 21
SS (rep. 2)	July '02	94 \pm 9	64 \pm 26
WC	Mar. '03	92 \pm 4	68 \pm 23